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Section I

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IN THIS ISSUE

Cost Accounting for Distillers of Alcohol, Gin and Whiskey, by J. R. O'Connell 557

Standard Costs and Flexible Budgets in the Brewing Industry, by John W. Dixon 593

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EDITORIAL DEPARTMENT NOTE

Since the recent repeal of the Prohibition Amendment, distillers and distributors of spiritous liquors have been so busy securing permits and filling orders that they have had little time to think of anything else. As the industry begins to get stabilized again, distillers are finding the circumstances and conditions under which they must operate quite different from those which existed prior to the passage of the Eighteenth Amendment. These changes, together with the improvements in accounting methods and practices over the past 14 years, will necessitate many revisions in distillery accounting methods.

In this issue of our Bulletin we are presenting an article on distillery cost accounting which should be helpful to anyone interested in this subject. J. R. O'Connell, the author of this paper, was graduated from Duquesne University and has taken specialized courses at the University of Pittsburgh and at Columbia University. He was awarded a C.P.A. certificate in Pennsylvania in 1923. Mr. O'Connell began his public accounting career at the age of 20, as a junior accountant with the Union Audit Co. of Pittsburgh. Later he served for some time on the staff of Collins & Co., C.P.A.'s of Pittsburgh, after which he organized the firm of J. R. O'Connell & Co., C.P.A.'s. He then became associated with the firm of Crowther, Mohler and Gardner, C.P.A.'s. After about two years, he reorganized his own firm. He has been engaged in the practice of public accounting for the past 17 years, during which time he has also taught accounting and business administration. He gathered the material for this paper from numerous interviews with distillery executives and from an examination of the many books and reports listed in the accompanying bibliography. Mr. O'Connell was a charter member of our Pittsburgh Chapter and is at the present time a member of our New York Chapter.

In our Bulletin of August 1, 1933, we published two papers on brewery accounting. In this issue of our Bulletin we are presenting another paper on the subject. This paper is based upon an actual installation which the author recently made in a large brewery and is perhaps one of the earliest applications of standard costs and budgetary control in the brewing industry.

John W. Dixon, the author of this paper, has been a member of the staff of Scovell, Wellington & Co., at its Cleveland office, since his graduation from Yale University in 1928. He has had much experience in the installation of standard cost systems and the preparation and operation of budgets in many industries.

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NATIONAL ASSOCIATION OF
COST ACCOUNTANTS

JANUARY 1, 1934

COST ACCOUNTING FOR DISTILLERS OF ALCOHOL, GIN AND WHISKEY

By J. R. O'Connell, B.C.S., C.P.A., New York, N. Y.

ALCOHOL as a chemical raw material is the basic ingredient that enters into thousands of manufactured products or commodities that contribute greatly to the health, comfort and welfare of every American household. Thousands of manufactured products could not be made available to the consumer, unless alcohol, as a chemical raw material, were used in the process of manufacture. Alcoholic products are usually manufactured at a relatively low price because manufacturers are able to use denatured alcohol, free of Federal tax, under the provisions of the tax-free denatured alcohol act passed by Congress more than 25 years ago.

The magnitude of the Government's task in controlling alcohol for lawful commercial manufacture purposes may be easily realized by the fact that there were in excess of 175,000 individuals, firms, and corporations, whose business operations came directly under Government control and supervision, by virtue of permits issued by the Bureau of Industrial Alcohol.

Denatured Alcohol

Denatured alcohol is alcohol to which are added certain substances called denaturants to render the liquid unfit for beverage purposes. The denaturants, however, do not interfere with the special commercial uses for which the alcohol is intended in manufacture. Denatured alcohol is intended solely for use in arts, science and industry manufacture in the production of thousands of lawful commodities of everyday use.

Congress made denatured alcohol free of Federal tax to promote American industry, and in exacting the tax-free denatured alcohol act, Congress' first duty was to guard the Federal revenue by making denatured alcohol unfit for beverage purposes. Some of the special formulas are handled on Government permit.

Characteristics of Denaturants

Some of the requirements of an effective general denaturant are as follows:

1. It must render the alcohol obnoxious and nauseating, and wholly unfit for use as a beverage.
2. It must not be corrosive.
3. It must be available in large quantities and at a reasonable cost.
4. It must not affect the utility of the alcohol for lawful uses.
5. It must remain with the alcohol under both distillation and chemical treatment and not be eliminated, except with extreme difficulty and expense.

Government Supervision

Government records show the quantity of denatured alcohol produced and the quantity received by manufacturers and other users. The quantity of products manufactured is ascertained from Government's current and past records. Government chemists know the quantity of denatured alcohol necessary for such production. Laboratory tests made of finished alcoholic products on the market disclose any violations of Bureau of Industrial Alcohol regulations. The Government has methods of determining the possible diversion of denatured alcohol, and these methods are used against the skilled technician who is able to recover alcohol from any mixture, if he has the necessary facilities and resources at his command.

No denaturant has been discovered which is impossible of removal when added to ethyl (pure) alcohol. Wood alcohol (methyl) is probably the best non-exception. The chemical industry has been working on this problem for 50 years, and such a denaturant has not yet been discovered.

Laboratories are maintained by the Bureau of Industrial Alcohol to prepare formulas for denaturing alcohol, and to test formulas used by every manufacturer applying for a permit to use industrial alcohol.

The Government officers frequently inspect the alcohol and other manufacturing plants, and have access to the company's books and records. Shipments of alcoholic products may be watched. A check can be made of the disposition of alcohol to the purchasers. Every precaution is taken to see that all business transactions are legitimate from the time the denaturant is received until the manufactured product is marketed. Industrial alcohol under Government control includes ethyl alcohol in its pure state.

Ethyl Alcohol

Ethyl alcohol is manufactured largely from the fermentation of molasses and grain. It is also now being manufactured synthetically from ethylene gas. Ethyl alcohol made synthetically is produced by a combination of chemical elements, as distinguished from fermentation processes.

It is, therefore, essential that this writing be limited to discussion of alcohol manufactured from molasses and grain, and distinguish the particular accounting procedure for alcohol, spirits, gin and whiskey manufacture.

The system of accounting herein described conforms to the following Government regulations:

1. Keep all files and records required by Treasury regulation.
2. File reports at such times and in such forms as required by Treasury regulations.
3. Keep and render such records and reports as may be required by any state or Federal law or regulation.
4. Keep all records and files on the premises described in the permit.
5. Safely preserve all records and files for a number of years in such manner as to assure permanency and accessibility for inspection by the Commissioner, supervisor, Attorney-General or any other duly authorized person.
6. Keep records pertaining to liquor *manufactured, received, possessed, used or disposed of under authority of permit.
7. Keep all records pertaining to any materials and the production of such spirits or any product made therefrom.

Other Required Records Are:

(a) Quantity of alcohol or other intoxicating liquor received.
(b) Quantity of alcohol or other intoxicating liquor on hand at all times.
(c) Names of products in which alcohol or other intoxicating liquors are used.
(d) Quantities of gallons, however expressed, of each product manufactured, and alcoholic content of such product.
(e) Original invoices showing complete data.

*Liquor is term used in regulations, applies to all alcoholic spirits.

It is expected that the Department of Agriculture will control the distilling business until Congress meets and can enact legislation to deal with the situation. In all events, regulations as set out by the United States Treasury Department, Bureau of Industrial Alcohol, will, for a time, govern the distilling business.

Cost Accounting and Production System

In order that the products, molasses and grain, and process ingredients may pass through the plant in the most economical and efficient manner, and in order that the responsibility for the various steps in the manufacture of alcohol, spirits, whiskey or gin may be fixed "Process Cost Procedure" is appropriate. A well-designed costing system, departmentalized, can be used to maintain the manufacturing costs; that is, the cost system should record all additions to or subtractions from inventories in quantities and at the same time record the effect as far as quantity and value is concerned on a proof gallon basis.

It is necessary to check the book value at intervals. During the time between one inventory and another the management can feel fairly happy that the technique of operating the plant and accounts is accurate.

It is interesting to look into formulas as these are guarded from persons who may transact with them.

Usually, in a certain class of whiskey the formula is as follows:

25% rye, 10% malt, 65% corn.

Another whiskey is made by using 80% rye and 20% malt. Some few distillers use all rye by malting portions of their rye. Formulas are established, but the use of standards does not end with the fixing of the standard formula. There must be some record of accomplishment in production as compared with the costs set, and the costs of manufacture should be based on a proof gallon content.

Whiskey may be manufactured in its completed state at the approximate following prices:

Approximate Manufacturing Cost Per Gallon

Cologne Spirits, 26¢ to 36¢ (includes cost of barreling)
Bourbon Whiskey, 37¢ to 47¢
Rye Whiskey, 40¢ to 50¢

The distillers are subject to agreement with the Federal Government that processing costs apply to purchases of basic grain products. A compensating tax applies upon basic grain when imported into the United States.

The Commissioner of Internal Revenue gives information as follows:

4 to 4½ gallons proof spirits from one bushel of rye.
4½ to 4¾ gallons proof spirits from one bushel of corn.

In the Manufacture of Alcohol From Molasses

The molasses goes directly to the fermenters from the storage tanks, and is dissolved with water to the point at which the yeast will operate. Molasses is at present the cheapest raw material for alcohol production and is used mostly in plants where denaturants are used. Molasses cost varies from 14¢ per gallon upward.

Department "A", set out in the accounting system outline, would be varied to conform with receipt, storage and use of molasses.

The monthly production reports should be in Schedule E form, using molasses gallons as follows:

Molasses Gallons	*Debit*	*Credit*
Bulk inventory first of month	√	..
Receipts—Molasses	√	..
Shipments—Molasses	..	√
Volume—*Loss*—Gain	√	..
Bulk inventory close of month	..	√
Delivered to Distillery	..	A √
Totals in gallons	.....	.....
Delivery to Distillery	A √	..
Inventory first of month	√	..
Loss and Gain	√	..
Inventory close of month	..	√
Put in Process	..	B √
Total	.....	.....
Put in Process	B √	..
In process end of month	√	..
Loss and Gain	None	None
In process end of month	..	√
Unused in fermenter mashes	..	√
Total	.....	.....

Mixture of Molasses, Water and Yeast	*Debit*	*Credit*
Mash on hand in fermenter—first of month...	√	..
Mash set during month.....	√	..
Mash on hand in fermenter at end of month...	..	√
Mash delivered to Beer Still.....	..	√
Total	.....	.....
Proof of Gallons		
Alcoholic content of beer delivered from fermenter	√	..
Loss—Gain	..	√
High Wines produced and deposited in High Wines receiving tanks.....	..	C √
Spirits taken into continuous process.....	..	D √
Total	.....	.....
High Wine Receiving Tank Inventory at the first of the month.....	√	..
High Wine Production above.....	C √	..
High Wine Receiving Tank Inventory at the end of the month.....	..	√
High Wines Pretreated.....	None	None
High Wines Delivered re-distills.....	..	D √
Total	.....	.....
Pretreated High Wines Inventory first of Month	None	None
High Wines received above.....	"	"
Pretreated High Wine Inventory at the end of the month	"	"
Loss—Gain	"	"
Pretreated High Wines delivered redistills....	"	"
Total	.....	.....
Low Wines Inventory at the first of the month	√	..
Low Wines Production.....	√	..
Low Wines Inventory close of the month.....	..	√
Low Wines re-distilled.....	..	D √
Total	.....	.....
Re-run Inventory first of the month.....	None	None
Re-run Production (see re-distill section)....	"	"
Re-run Inventory close of the month.....	"	"
Loss—Gain	"	"
Re-run Re-distilled	"	"
Total	.....	.....

Re-distill charging tank Inventory at the first of the month	None	None
Receipts into charging tanks:		
High Wines	"	"
Low Wines	"	"
Re-runs	"	"
Loss—Gain	"	"
Re-distill charging tank inventory at the close of the month	"	"
Total	.....	.....
Put into Re-distill from above		
Charging tanks	xxxxx	None
High Wines	xxxxx	D V
Pretreated High Wines	xxxxx	None
Low Wines	xxxxx	D V
Re-runs	xxxxx	None
Beer Still continuous process	xxxxx	D V
Total Distilling Load	xxxxx	E V
Low Wine Production (low wine section)	xxxxx	V
Re-run Production (re-run section)	xxxxx	None
Produced and deposited in alcohol receiving tanks	xxxxx	V
Fusel Oil Production	xxxxx	V
Loss added—Gain deducted	xxxxx	V
Total Distilling Load	xxxxx	E V

Production Schedule in Proof Gallons

Absolute alcohol	
Spirits	
Alcohol grade	
Denaturing grade	
Total	....

By observing the corresponding alphabet letters the production may be traced into the next operation. A. indicates where gallonage appears.

In the schedules Re-Run and Re-Distill is the word "none" for debit and credit. In the process, especially at start of production, or starting up of the lines, there may result a grade below standard. Then a re-run or re-distill is necessary to bring the content to standard grade.

Taxes

The alcoholic content of whiskey is known as proof. The Standard is 50% alcohol by volume which is known as 100%

proof (half water and half whiskey). A proof gallon is a gallon of alcoholic liquor containing half its volume in alcohol. Such a gallon with 75% alcohol would be 150% proof gallons.

A gallon of whiskey after storage which is 100% proof or less is a tax gallon, and is taxed as 100% proof. A gallon, for instance, with 60% alcohol (120 proof) is 1.2 tax gallons and is taxed accordingly. Since January 1, 1928 the Government's tax rate is $1.10 per proof gallon or wine gallon when below proof, and proportionately at a like rate on fractional parts of such proof or wine gallon. The Government regulations provide that any tax imposed by law upon alcohol shall attach to such alcohol as soon as it is in existence as such.

Internal Revenue Tax Payment Schedule

The schedule should be a part of the monthly factory report and contain the following information:

1. Tax-Paid Inventory at the beginning of the month.
2. Tax-Paid during the month.
3. Tax-Paid Receipts.
4. Total Accountable.
5. Tax-Paid Inventory at end of the month.
6. Tax-Paid Shipments.

Information for the foregoing items should be given for gallons and values.

As a part of the schedule there should be submitted the particulars of gallons and tax-paid values representing shipments as follows:

1. Customer Shipments.
2. Warehouse Shipments.

Customer shipments should be classified according to the billing division. Warehouse shipments should be classified according to the warehouse to which the shipment was made.

Relative to any tax-paid receipts, information should be given showing the name of the warehouse or customer from whom the tax-paid gallons were received, showing both the gallons and tax-paid value.

Evaporation and Soakage

Evaporation reduces whiskey from 6 to 10% the first year of aging, 3 to 5% each year thereafter. Seventeen-year-old whiskey has evaporated some 50%.

Where whiskey is held in storage by the manufacturing company the warehouse inventory record should be in such form as to permit an entry upon the books in the nature of accumulated carrying charges covering evaporation and soakage. Based on these, the selling price may be adjusted. The selling price of all alcoholic products is by trade custom a profit or loss market proposition.

Depreciation

Fixing proper accounting practice for depreciation and building up records in respect of depreciation are two of the most difficult points in the accounting of distillers of ethyl alcohol from molasses and grain.

There is a varied assortment of assets making up the plant, therefore the method of calculation should be the subject of serious consideration. A plant ledger should be kept, showing asset numbers corresponding to numbers on the machines and equipment.

Two systems of depreciation are generally used:

1—The straight-line method—a fixed percentage monthly on plant values. In companies which employ the straight-line method the depreciation is taken on the estimated useful life of the property and the percentages applied are approximately as follows:

Buildings	2½%
Land improvements:	
Underground piping	2%
Sidewalks, fences, etc.	4%
Machinery and equipment	5% to 7%
Automobiles and trucks	25%
Furniture and fixtures	10%
Miscellaneous costs	5%

2—Gallonage Method—where all depreciation is based on a gallonage output. Over a period of several months the production is at an excess capacity, while in other months the production is low. February, March, April and May are usually low production months.

To indicate preference for any particular method would probably result in a discussion which would be rather outside the scope of this writing. The most commonly accepted of accounting conventions as to depreciation, anticipates a high amortization and de-

preciation charge in near future when production settles to a point of low output. Various types of equipment now in use may not be needed in the future.

Deferred Charges

(See Balance Sheet). The greater portion of this item was set up to include depreciation, taxes, overhead, expenses, etc., termed unabsorbed expenses deferred, to be absorbed in future operations on a gallonage basis. (These procedures were disclosed to the writer during his research at several plants.)

Reserve for Drums

It should be pointed out that certain style drums are returnable; therefore, a reserve is established against these returnable drums. Next it is an entry for Accounts Receivable or tangible reserve established where drums costing $2 and $3 are shipped to the customer at a price of $14 or $16 with the understanding that the drums are to be returned and the customer's account credited with the charge.

Frequently drums of a make known as "one-time shipper drums" are not returnable. These are used for specific articles.

These drums are in common use for shipments of denatured alcohol.

Gin Manufacturing

Gin is manufactured from alcohol usually produced from grain. juniper berries are added to the alcohol immediately after it comes into form.

Accounting System and Accumulation of Costs of Manufacturing

Process Ingredients

This account is charged with cost of process ingredients such as hops, caustic soda, sulphuric acid, and juniper berries (used in gin) acquired by purchase. The account should be credited with the cost of all ingredients used—the charge being to the proper manufacturing account.

There should be a perpetual inventory record maintained for each of these process ingredients.

On a schedule accompanying the balance sheet should be submitted monthly a schedule showing the following information:

A. Name of process ingredient.
B. The quantity on hand at end of month.
C. Value.

Denaturants

This account should be charged with the cost of all denaturants purchased or otherwise acquired. The account should be credited with the cost of denaturants used in manufacture or otherwise disposed of.

A perpetual inventory record should be kept.

On a schedule accompanying the monthly report should be supplied the following information relative to the cost of denaturants used in manufacturing:

A. Name of the denaturant alcohol formula into which the denaturant entered.
B. Cost of the denaturant used in the current month.
C. The accumulated cost of denaturants so used for the year to date.
D. Name of the denaturant.
E. Quantity on hand at the end of the month.
F. Value thereof.

Empty Containers

This account should be charged with the cost of empty containers, except empty returnable containers, acquired by purchase or otherwise, and should be credited with the cost of empty containers filled with finished product or otherwise disposed of. The contra debit will, of course, be to the account, "Filled Containers."

Accompanying the financial report should be a schedule of the inventory of empty containers on hand at the end of the month, showing the following information:

A. Style or type of container.
B. Quantity on hand.
C. Cost.

The aggregate of the cost should be in accordance with the amount shown on the trial balance for this account.

Factory Supplies

This account should be charged with the cost of all factory supplies. A perpetual inventory should be kept.

Fuel

This account should be charged with the cost of fuel (coal and fuel oil) and a perpetual inventory should be kept. On the monthly factory report, information should appear as follows:

A. Kind of fuel.
B. Quantity on hand at end of month.
C. Value thereof.
D. Quantity consumed during the month.
E. Cost of fuel consumed.

Empty Returnable Containers

This account should be charged with the cost of empty returnable containers. A perpetual inventory should be kept.

The contra credit to this account for containers filled should be to the account, "Filled Containers."

Raw Materials

This account should be charged with the cost of raw materials (corn, malt, rye, wheat, etc.) constituting the basic materials out of which alcohol, gins and whiskies are manufactured, acquired through purchase or otherwise, and credited with the cost of such materials used in manufacture or otherwise disposed of.

A perpetual inventory should be kept.

Accompanying the monthly financial statement, a schedule should report:

A. Kind of raw material.
B. Quantity on hand at end of the month.
C. Value thereof.
D. Quantity used in manufacturing operations during the month.
E. Cost thereof.

Perpetual Inventories

These inventories should show:

1. Date of receipt.
2. Quantity received.

3. Cost.
4. Date of use or other disposition.
5. Quantity disposed of and cost.

At frequent intervals physical inventories should be taken and checked against book inventories, and any necessary adjustments of the book inventory should be made.

Inventories should be valued at cost or market, whichever is the lower, and the "cost" unit price used should be the latest cost price. All gains or losses should be taken into the account.

Any items of the inventory which are disposed of by sale or otherwise should, of course, be credited to the account.

Manufacturing Costs

This account should be charged with all manufacturing costs, and these should be departmentally classified so as to allocate the costs in so far as possible to definite production centers.

The classification may be as follows:

1. Labor.
2. Repairs and maintenance.
3. Depreciation.
4. Sundry.
5. Materials.
6. Insurance.
7. Taxes.

On a schedule accompanying the factory report should be reported the departmental costs for the month and the year to date. These departments are as follows:

Dept. A. Raw materials storage and processing.
B. Fermenting process.
C. Beer distillation.
D. High wine distillation.
E. Whiskey rectification.
F. Gin distillation and rectification.
G. Fusel oil distillation.
H. Cistern room.
I. Distillery bonded warehouse.
J. Ethyl alcohol bonded warehouse.

K. Power.
L. Denatured alcohol bonded warehouse.
M. Outside denatured warehouse.
N. Factory office.
O. Cooperage.
P. General.
Q. Alcohol bottling.
R. Dried feed.
S. Rectification house.
T. Rack warehouse.
U. Laboratory.

An explanation of processes and accountancy outlines applicable to the departments A to U inclusive, follows:

A. *Raw Materials Storage and Processing*

Raw materials (corn, rye, wheat, malt, etc.) are received in car lots, unloaded by power shovel, conveyed over separators into outside grain storage tanks, discharged therefrom through an electric magnetic separator into inside storage bins, conveyed therefrom to the mills and ground into meal, and, thereafter, weighed out into the cookers.

The operating costs charged to this department are as follows:

1. Operating power shovel and unloading grains from cars to hopper.
2. Tending conveyors used in unloading operations.
3. Tending grain receiving separator.
4. Tending power engine.
5. Tending grinding mills and discharge lines to stock bins.
6. Emptying dust and disposal of refuse.
7. Handling meal, including the weighing thereof and discharge to cookers.

B. *Fermenting Process*

The meal is delivered to cookers, there it is cooked by steam and conveyed through coolers to fermenters. The meal is received over meal scales into the yeasting room, and there converted into yeast and discharged into fermenters and discharged therefrom as

beer into the beer still. All these constitute the operations of the fermenting department.

The labor chargeable to this department is as follows:

1. Tending the cooker and yeast agitators.
2. Yeasting labor.
3. Tending the cooling system.
4. Tending the fermenting tubs.
5. Tending the beer well.

C. *Beer Distillation*

The beer is pumped from the well into the beer still, and through the distillation process high wines are recovered. Passing from the beer still is slop which is delivered as,

1. Whole or thick slop to the dried feed house, or as
2. Thin slop to fermenters. (Used for additional fermentation.)

The labor chargeable to this department follows:

1. Tending beer pumps in still tower.
2. Tending beer still apparatus.

D. *High Wine Distillation*

High wines are re-distilled for the purpose of producing spirits of 190 or lower proof, thereafter to be transferred to the cistern room and/or to be diluted and used in the rectification of whiskey.

The labor chargeable to this department is as follows:

1. Receiving, storing and handling high wines.
2. Receiving, storing and handling low wines.
3. Preparing, charging and tending kettle stills and columns.

E. *Whiskey Rectification*

High wines pass from high wine tanks to whiskey rectification apparatus, or spirits produced from high wine distillation may be delivered to whiskey rectification apparatus, and after rectification the whiskey will be delivered to the cistern room.

Labor in this department is chargeable as follows:

1. Tending whiskey kettles.
2. Tending whiskey rectification apparatus.
3. Transferring whiskey to cistern room.

F. *Gin Distillation and Rectification*

Spirits, resulting from the distillation of high wines, are diluted with distilled water and introduced into gin kettle stills, there distilled and then delivered through pipe lines into the cistern room. Incident to the distillation the kettles will be charged with various ingredients, such as juniper berries, orange peel, etc.

The labor chargeable to this department is as follows:

1. The handling and storing of the spirits from which the gin is to be distilled.
2. Tending the gin distilling apparatus.
3. The transfer of the gin to the cistern room.

G. *Fusel Oil Distillation*

Incident to the distillation of high wines a by-product, fusel oil, may be recovered.

Labor chargeable is as follows:

1. Tending fusel oil apparatus.
2. Washing fusel oil apparatus.
3. Storing, handling, packaging and shipping fusel oil.

H. *Cistern Room*

In the bonded cistern room are located various cisterns into which is received the finished product consisting of:

A. Gin.
B. Spirit whiskey.
C. Straight run whiskey.
D. Re-processed whiskey.

From this room products are withdrawn into packages and transferred to the distillery bonded warehouse.

Labor chargeable to this department is as follows:

1. Receiving, storing and handling products in the cisterns.
2. Withdrawing and packaging the products.

I. *Distillery Bonded Warehouse*

Into this warehouse is received gin and whiskey in packages

from the cistern room. From this bonded warehouse packaged products may be transferred in bond to

A. The rectifying house and, or

B. The bonded warehouses for aging (rack warehouses) or packages may be tax-paid and shipped.

The labor chargeable is as follows:

1. Receiving, storing and handling packaged goods.
2. Labeling and tax-paying packaged goods.
3. Shipping tax-paid package goods.
4. Transferring in bond the packaged goods.

J. *Ethyl Alcohol Bonded Warehouse*

Into this warehouse is received alcohol of various grades, taken into account over the weighing scale and deposited thereafter in various storage tanks. From this warehouse alcohol may be withdrawn either for transfer in bond to a bonded warehouse, or tax-paid for shipment to tax-paid warehouse or to the customer.

The labor chargeable is as follows:

1. Receiving, storing and handling ethyl alcohol.
2. Withdrawing, packaging, filling and shipping.

K. *Power*

The power for the plant is produced through the use of a number of boilers, using coal or fuel oil. In addition to the production of steam, this department has to do with the supply of well and river water for cooking and cleaning operations and with air for agitating and cleaning.

Labor chargeable to this department is as follows:

1. Receiving and unloading coal and fuel oil.
2. Discharging coal from coal storage bin and operating stocker.
3. Firing and tending stoker engine for the water pumps and boiler room equipment.
4. Raking ashes, tending ash pump and disposing of ashes.
5. Tending, oiling and greasing well and river water pumps in the main pump house.
6. Tending, oiling and greasing air compressors.
7. Tending steam feed and exhaust lines in boiler rooms and water supply lines in pump houses as well as all such power lines in various departments.

L. *Denatured Bonded Warehouse*

In this warehouse is received by transfer from the ethyl alcohol bonded warehouse supplies of ethyl alcohol for denaturing purposes.

To the alcohol so received is added denaturants and through mixing operations the finished denatured alcohol produced. From this warehouse all shipments and transfers of denatured alcohol are made except that C D No. 5 completely denatured alcohol may be transferred to an outside un-bonded warehouse for packaging and shipping.

Labor chargeable is as follows:

1. Receiving, storing and handling ethyl alcohol.
2. Receiving, storing and handling denaturants.
3. Denaturing ethyl alcohol.
4. Receiving, storing and handling containers, delivered to this warehouse.
5. Filling, stenciling, loading and shipping packages containing denatured alcohol.

M. *Outside Denatured Alcohol Warehouse*

Into this warehouse is received denatured alcohols transferred from the denatured bonded warehouse and other sources, but not transferred in bond. From this warehouse containers are packaged and shipped as un-bonded denatured alcohol.

Labor in this warehouse is as follows:

1. Receiving and storing denatured alcohol in the million gallon tank.
2. Receiving, storing and handling denatured alcohol in outside warehouse.
3. Handling, storing, hauling, filling, stenciling, packaging and bonding denatured alcohol in containers in this outside denatured alcohol warehouse.

N. *Factory Office*

Labor chargeable to this department will consist of all clerical labor of whatsoever nature.

Departmental cost accounts should contain substantially the following sub-accounts:

1. Postage
2. Stationery and office supplies
3. Telephone and telegraph
4. Sundry charges

and such other classifications as may be required to maintain the proper account analysis of such sundry charges.

O. *Cooperage*

The operations of this department has to do with the receipt, storage, conditioning and maintaining empty containers.

Labor chargeable is as follows:

1. Receiving, storing, unloading and handling empty containers.
2. Gluing, drying and conditioning barrels.
3. Maintaining and repairing containers.
4. Delivering containers to the various warehouses for filling and shipping.

P. *General*

This department includes all factory activities and operations not otherwise classified.

Labor chargeable thereto should be as follows:

1. General supervisory labor not directly chargeable to any particular department.
2. Labor receiving and unloading stores, materials and supplies in the storeroom (not including, however, the labor in receiving, storing and handling raw materials which is chargeable to the raw materials department and not including labor incident to receiving, storing and handling of empty containers which is chargeable to the cooperage department, and not including receiving, storing and handling of denaturants, which is chargeable to the denatured bonded warehouse department.)
3. Janitor, cleaning and porter service throughout the plant.
4. Watchman and garage labor.
5. Chauffeur, truck driving and delivery labor.

No raw materials are chargeable to this department, but it should be noted that the cost of gasoline, oils and greases, used in the operation of automobiles should be charged to the account No. 5 above.

Q. *Alcohol Bottling*

This department has to do with the bottling of ethyl alcohol.

Labor chargeable is as follows:

1. Receiving, storing and handling ethyl alcohol for bottling.
2. Bottling, packaging and shipping bottled alcohol.

R. *Dried Feed*

This department operates to recover dried feed (distillers' dried feed) from slops delivered from the beer still. The operations consist of receiving the whole slop into storage tubs, agitating same to prevent the settling of solids, and transferring the slop through filter presses into the driers. After drying, the slop is transferred into evaporators where concentrated syrup is added, and from such driers the product is discharged into a storage and sacking room. The product is loaded from such storage into cars.

The labor chargeable is as follows:

1. Receiving and handling the slop from the beer still.
2. Tending presses, driers, engine pump and evaporators at the feed house.
3. Storing, handling, sacking and shipping the dried feed.

S. *Rectifying House*

This is a tax-paid bonded warehouse containing storage tanks wherein is received by transfers from the distillery bonded warehouse supplies of gin and whiskey. Any reduction of proof of gin and whiskey together with the blending and the flavoring thereof is done in this department. In this house gin and whiskey are bottled, labeled and cased properly for shipment, and herefrom the case goods will be loaded and shipped.

Labor chargeable and classified is as follows:

1. Receiving, storing and handling whiskey.
2. Receiving, storing, handling gin.
3. Rectifying, blending and flavoring whiskey and gin.
4. Labeling, bottling, casing and crating whiskey and gin.
5. Loading and shipping whiskey and gin.

The cost account should be divided so as to show labor applicable to whiskey and to gin.

T. *Rack Warehouse*

In this warehouse is stored whiskey in barrels for aging purposes.

Labor is as follows:

1. Receiving, storing and handling whiskey.
2. Labor connected with the periodical inspection of the stored whiskey.
3. Loading and shipping whiskey.

U. *Laboratory*

The laboratory is maintained to make analyses and tests required in the production of the various products, to control the yeasting and fermenting operations and provide the required technical production reports.

Summary Accumulation of Costs of Manufacturing

Cost Ledger

Stores—Process ingredients.
Stores—Denaturants.
Empty containers (other than drums).
Factory supplies.
Fuel, oils and greases.
Empty returnable drums.
Empty non-returnable drums.
Accounts payable or to General Ledger or General Office.
Factory receivables.
Internal revenue taxpaid.
Freight prepaid.
Filled containers (other than drums).
Filled returnable drums.
Filled non-returnable drums.
Warehouse supplies.
Stock room inventories.

Manufacturing Costs

Raw materials department:

1. Labor—receiving, storing, handling outside bonded warehouse.
2. Repairs and maintenance.
3. Depreciation—buildings, machinery and equipment.
4. Sundry departmental charges.

Fermenting Process

1. Labor—handling raw materials on bonded distillery premises, yeasting, fermenting, cleaning tubs, and all labor in process line up to beer still.
2. Repairs and maintenance.
3. Depreciation—buildings, machinery and equipment.
4. Sundry departmental charges.
5. Process ingredients.

Distilling Process

1. Labor at beer still, high and low wine and re-run receiving tanks redistill operations and all labor in process line up to and including the weighing tank.
2. Repairs and maintenance.
3. Depreciation—buildings, machinery and equipment.
4. Sundry departmental charges.
5. Process ingredients.

Ethyl Alcohol Bonded Warehouse

1. Labor receiving, handling, storing, transferring, packaging, entering and shipping non-beverage and tax paid alcohol, except bottled alcohol.
2. Depreciation—buildings, machinery and equipment.
3. Repairs and maintenance.
4. Sundry departmental charges.

Power Plant

1. Labor receiving, storing, handling fuel, firing boilers, tending pumps and motors wherever located in the plant except dried feed power department.
2. Repairs and maintenance.

3. Depreciation—buildings, machinery and equipment.
4. Sundry departmental charges.
5. Fuel oil and coal used (per schedules).
6. Power and water purchased.

Denatured Alcohol Bonded Warehouse

1. Labor receiving and handling ethyl alcohol; processing, packaging, loading and shipping denatured alcohol.
2. Repairs and maintenance.
3. Depreciation—buildings, machinery and equipment.
4. Sundry departmental charges.
5. Denaturants used—denaturing process.

Outside Denatured Warehouse and Storage

1. Labor, receiving, storing, handling, entering, transferring, shipping denatured alcohol.
2. Repairs and maintenance.
3. Depreciation—buildings, machinery and equipment.
4. Sundry departmental charges.

Factory Office

1. Factory office—clerical labor.
2. Repairs and maintenance.
3. Depreciation—buildings, machinery and equipment.
4. Sundry departmental charges.

Cooperage and Container Maintenance

1. Labor receiving, storing, handling, maintaining and conditioning all containers.
2. Repairs and maintenance.
3. Depreciation—buildings, machinery equipment.
4. Sundry departmental charges.
5. Freight paid on empty containers returned.

General—Not Otherwise Classified

1. Factory supervision and other salaries and labor not otherwise classified.
2. Repairs and maintenance.
3. Depreciation—buildings, machinery and equipment.

4. Sundry departmental charges.
5. Watchman and guard labor.
6. Auto and delivery equipment labor.
7. Repairs and maintenance, autos and delivery equipment.

Laboratory

1. Labor in laboratory.
2. Repairs and maintenance.
3. Depreciation—buildings, machinery and equipment.
4. Sundry departmental charges.

Bottling Alcohol

1. Labor receiving, handling and shipping bottled alcohol.
2. Repairs and maintenance.
3. Depreciation—buildings, machinery and equipment.
4. Sundry departmental charges.

Dried Grain

1. Labor processing, handling, shipping dried grain, coal, fuel, oil, power purchase costs.
2. Repairs and maintenance.
3. Depreciation—buildings, machinery and equipment.
4. Sundry departmental charges.
5. Dried feed power plant.
6. Labor producing power for dried feed department.

The accounts as listed in the cost ledger can be compiled as recommended, by appropriate requisition and order, and warehouse forms.

The design and installation of these forms is, to a degree, based upon receipt and disposal.

Sundry Departmental Charges

In addition to sundries as the term applies, the following are included, allocated to departments:

Cost of cases, used empty barrels, sacks, bottling charges, bottles, labels, caution notices, caps, cartons, dose cups, corks, strip labels, Government case stamps, supplies, paste, labeling gum, nails, cheesecloth, soda, ink, staples, charcoal, burning brands, thermometers, twine, etc.

INCOME AND OPERATING ACCOUNTS

Income

Sales—Case goods, warehouse certificates, barrel goods, dried grains (or may be deducted from purchase cost of grains).
Used empty barrels (or may be a credit to the cooperage account).
Bottling income (realized from bottling for outside owners).
Storage income.
Rents received.
Taxes, express, etc., paid by customers.

Cost of Sales

Manufacturing summary and other adjustments.
Costs of preparing dried grains.

Expenses

Revenue taxes.
State and county taxes.
Insurance
Freight and express.
Warehouse wages.
Warehouse expenses.
Commissions.
Officers' salaries.
Traveling expenses.
Advertising.
Legal and accountancy.
Office salaries.
Stationery and Printing.
Depreciation (other than manufacturing).
Interest and discount.
Bad debts.
Income and excess profits taxes.
License expenses.
Breakage (with 2% added).
Repairs (reconstruction small items).
Office expenses.
Excess outage.

The customary charge for bottling a receipt owner's whiskey is $5 per case. The usual cost of bottling is about $2 which leaves a profit of $3. An attempt is made to make the same profit as on commercial sales.

Carrying charges in storage will currently approximate 25¢ per barrel per month.

The sales of dried grains to dealers represent income which may mean the difference between a profit and a loss to the distiller. It is most essential that these grains be recovered, dried and sold if the capacity of the plant justifies it.

Recovery of a by-product, CO_2 (used for carbonated soft drinks, dry ice and fire extinguishers) has aroused controversy as to satisfactory income for the expensive machinery outlay and patent rights costs.

BALANCE SHEET ACCOUNTS

Assets

Current Assets

Cash
Notes receivable—Secured by warehouse receipts.
Notes receivable—Trade.
Accounts receivable—Trade.
Futures (grain contracts at cost).
Inventories: (Cost or market whichever the lower).
  Matured stock (show division of years).
  New spirits.
  Whiskey and other spirits in bond (all taxes paid or accrued are added).
  Whiskey and other spirits (tax-paid and ready for withdrawal).
  Imported goods (divided into tax-paid and unpaid).
  Products, materials and supplies.
  Containers.

Total Current Assets

Cash Surrender Value of Life Insurance.

Prepaid and Deferred Items

Insurance.
Taxes (state and county and Federal).
Miscellaneous.
Deferred expenses.

Total Prepaid and Deferred Items

Fixed Assets

Plant and Properties at cost.
Land and buildings.
Machinery and equipment.
Furniture and fixtures.
Automobiles.

Total Fixed Assets

Organization Expenses

Good will, trade-marks, formulas, etc.

Total Assets

LIABILITIES

Current Liabilities

Notes payable to bank.
Trade acceptances.
Accounts payable—trade and others.
Accrued liabilities (all payables as well as state and Federal).
Reserve for Federal Income Taxes.
Dividends payable on preferred stock (payable date).
Dividends payable on common stock (payable date).
Balance owing on futures (grains, etc.).

Total Current Liabilities

Reserves

*For depreciation.
*For bad or doubtful accounts receivable.
State, county and local taxation (payable upon withdrawal).
For purchase contract shipments.
Provision for containers in customers' hands.
Provision for contingencies.

Total Reserves

Capital Stock

Surplus

Undivided Profits

Total Liabilities

*Proper to deduct from assets.

Reports and Records

The United States Treasury Department, Bureau of Industrial Alcohol regulations set out in complete detail the reports and records that must be kept. Regulations 2, 3 and 8 from the United States Government Printing Office are available upon request.

The accounting system should be so devised as to use these reports and records as a basis for accounting routine.

Companies' special requirements lead into special forms and statements; for example, see Distribution of Accounts for gin manufacturing exclusively (Schedule 1). Schedule 2, a statement of Manufacturing Expense and Cost of Production, shows manufacturing costs, up to and including cases filled. Note the sub-division totals agree with the distribution of accounts statement.

The interest of all management in the compilation of daily, weekly and monthly reports for all operations arises out of a consistent policy of preparing these reports, too numerous to set out in this writing. However, a few essential forms are shown as Schedules 3, 4, 5, 6, 7 and 8.

The monthly summary report for denaturants should cover and report:

A. Amount of denaturants.

B. Gallonage of alcohol and type grades.

C. Cost of denaturants.

D. Yield or total production.

SCHEDULE 1

Distribution of Accounts

Gin Manufacturing

Material		
01-01-01	Corn	Inventory
01-01-02	Rye	Inventory
01-01-03	Malt	Inventory
01-01-04	Stock Yeast	Inventory
01-01-05	Water	.....
01-01-06	Gin Material	Inventory
Labor		
01-04-01	Manufacturing Labor	.....
01-04-02	Still House Labor	.....
01-04-03	Cistern Room Labor	.....
01-04-04	General Factory Labor	.....
Expenses		
01-05-01	Miscellaneous Supplies and Expenses	Inventory
01-05-02	Yard Engine	.....
Power		
02-01-01	Fuel	Inventory
02-04-01	Boiler Labor	.....
02-04-02	Power Labor	.....
02-05-01	Power Supplies	.....
Repairs		
03-06-01	Repairs to Buildings	.....
03-06-02	Repairs to Equipment	.....
Overhead		
04-01-01	Plant Administration	.....
04-01-02	License Fees, Taxes, etc.	.....
Dried Grain		
05-04-01	Dried Grain Labor	.....
05-05-01	Dried Grain Bags & Expenses	Inventory
Cooperage		
06-04-01	Cooperage Labor	.....
06-05-01	Cooperage	Inventory
06-05-02	Cooperage Supplies and Expenses	Inventory
Bottling Dept.		
07-04-01	Bottling, Packing & Shipping Labor	.....
07-05-01	Cases	Inventory
07-05-02	Bottles (Breakage)	Inventory
07-05-03	Caps and Accessories	Inventory
07-05-04	Labels	Inventory
07-05-05	Wrappers	Inventory
07-05-06	Supplies & Expenses	Inventory
Administration		
09-04-01	Office Salaries	.....

Schedule 2.

Statement of Manufacturing Expenses and Cost of Production

Month of _____ 193__

	Bonded Spirits Not Gin in Transit Gallons	Gin in Cooperage Barrels	Gin in Cooperage Gallons
Inventory Last of Month			
Withdrawn			
Total			
Inventory First of Month			
Produced			
Barrelled			

Cases Filled	Cases	Gallons
Inventory First of Month		
Cases Bottled		
Total		
Inventory Last of Month		
Sold		

Manufacturing Costs	Amount	Cost per Gallon This Mo.	Cost per Gallon Last Mo.
Materials–Corn			
Rye			
Malt			
Stock, Yeast			
Water			
Gin Material			
Labor–Manufacturing			
Still House			
Cistern Room			
General Factory			
Expenses–Misc. Supplies & Exp.			
Yard Engines			
Power–Fuel			
Boiler Labor			
Power Labor			
Power Supplies			
Repairs–Buildings			
Equipment			
Overhead–Plant Admin. Charges			
Losses Fire, Theft, Etc.			
Sub-Total			
Dry Grain–Labor			
Bags & Expenses			
Current Month's Cost			
Add–Inventory First			
Sub-Total			
Less–Inventory Last			
Transferred to Cooperage			

Gin in Cooperage	Amount	Cost per Barrel This Mo.	Cost per Barrel Last Mo.
Gin Transf. from Tanks			
Cooperage Labor			
Cooperage			
Cooperage Supplies & Exp.			
Total			
Add–Inventory First			
Sub-Total			
Less–Inventory Last			
Transf. to Bottling Tanks			

Cases Filled	Amount	Cost per Case This Mo.	Cost per Case Last Mo.
Gin Transf. to Bottling Tanks			
Bottling, Packing & Shipping Labor			
Cases			
Bottles (Breakage)			
Caps & Accessories			
Labels			
Wrappers			
Supplies & Expenses			
Admin.–Office Salaries			
Total			
Add–Inventory First			
Sub-Total			
Less–Inventory Last			
Cost of Cases			

General Remarks, Etc. Explanation	Ref. No.	Debit	Credit

Miscellaneous Supplies Commodity	Quantity	Cost	Amount

Surplus and Shortages Commodity	Quantity	Cost	Amount

SCHEDULE 3

Factory *Month Ended*

Summary of Factory Shipments

Schedule	*Gallons*	*Pounds*
Bulk, Molasses, Corn, Malt		
Ethyl Alcohol—Bulk		
Ethyl Alcohol—Containers		
Tax Paid Alcohol		
Ethyl Alcohol—D.B. W.H.		
Bulk Formula D.B. W.H.		
Container Formula D.B. W.H.		
Bulk C.D. Alcohols		
Container C.D. Alcohols		
Dried Feed		
Fusel Oil		
Total		
Add Gain—Deduct Loss		
Shipments per Factory Daily Report		
Explanation of Gain or Loss		

SCHEDULE 4

Factory *Month Ended*

Production

Schedule	*Wine Gallons*
Untreated Inventory 1st of Month	
Transfer in, Schedule	
Total	
Deduct Untreated Inventory Close	
Remainder processed	
Water Added	
Bulk Inventory 1st of Month	
Transfer from Containers below	
Gain	
Total Accountable	
Bulk Inventory Close of Month	
Bulk Shipments	
To Containers below	
Loss	
Total Accounted For	
Container Inventory 1st of Month	
From Bulk Stock above	
Other Receipts	
Gain	
Total Accountable	
Container Inventory Close of Month	
To Bulk Stock above	
Loss	
Shipments	
Total Accounted For	

SCHEDULE 5

Factory *Month Ended*

Summary

C. D. Alcohol—Outside Warehouse

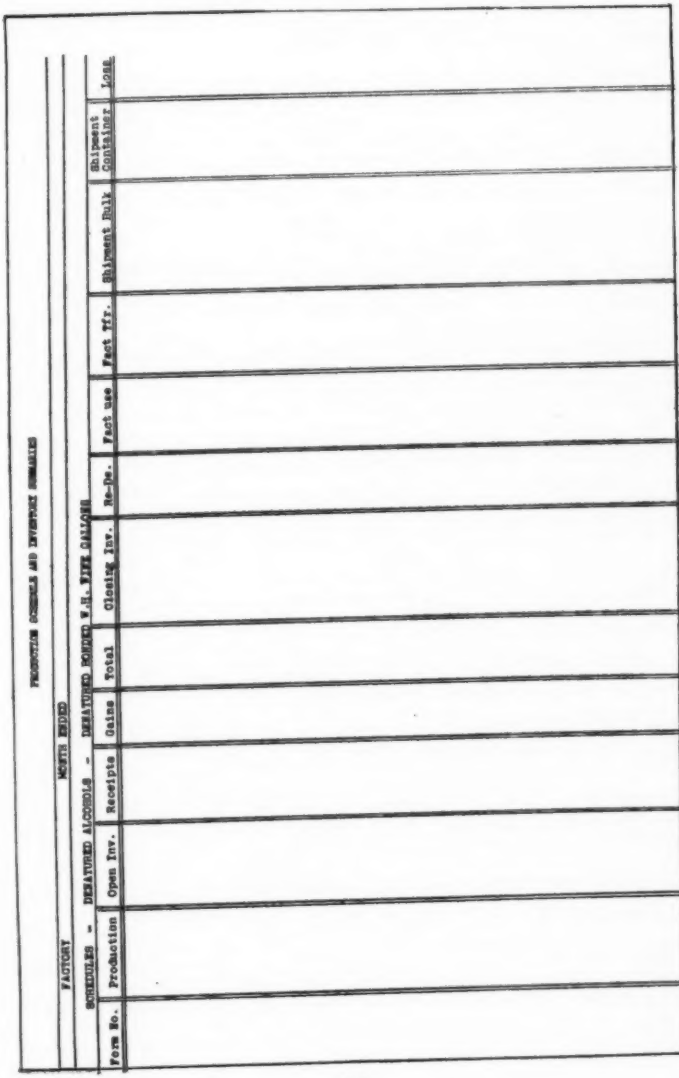
Schedule	*C. D. No. 1*	*C. D. No. 5*
Bulk Inventory 1st of Month		
Transfers in Schedule		
Received from Packaged Stock below		
Other Receipts		
Add Gain		
Total Bulk Accountable		
Shipped Bulk—Factory Report		
Closing Inventory Bulk		
Put in Containers below		
Used in Factory Operations		
Add Loss		
Total Accounted for		
Put in Containers above		
Receipts		
Opening Inventory Containers		
Transfers in Schedule		
Gain		
Total Accountable		
Shipments—Factory Report		
Used in Factory Operations		
Transferred to Bulk above		
Closing Inventory Containers		
Loss		
Total Accounted for		

SCHEDULE 6

Factory *Month Ended*

Schedule	*Molasses-Grain Cologne Spirits*	*Ethyl Alcohol Alcohol Grade*	*Den. B.W.H. Denaturing Grade*
Transfers Bulk (Schedule)			
Transfers Container (Schedule)			
Other Receipts			
Gain			
Opening Bulk Inventory			
Opening Container Inventory			
Total Accountable			
Used in Denaturing			
Loss			
Shipments			
Closing Bulk Inventory			
Closing Container Inventory			
Total Accounted for			

SCHEDULE 7


PRODUCTION RECORDS AND INVENTORY SCHEDULES
MONTH ENDED
FACTORY
SCHEDULE B - DENATURED ALCOHOL - DENATURED RECTIFIED U.S. FIVE GALLONS
Form No.
Production
Open Inv.
Receipts
Gains
Total
Closing Inv.
Re-Dw.
Fact use
Fact Wr.
Shipment Bulk
Shipment Container
Loss

SCHEDULE 8

Factory *Month Ended*

Schedule *Redistill Charging Tanks*	*Proof Gallons*
Untreated High Wines Received	
Treated High Wines Received	
Low Wines Received	
Re Run Received from Redistills	
Inventory 1st of Month	
Total	
Less: Inventory Close of Month	
Remainder	
Add Gain—Deduct Loss	
Total to Redistills	
Add from Beer Still Direct	
Total Redistill Charge	

Redistills	*Gallons Wine*	*Gallons Proof*
Delivered to Receiving Tanks:		
Cologne Spirits		
Alcohol Grade		
Denaturing Grade		
Low Wine Production		
Re Run		
Add Loss—Deduct Gain		
Total Redistill Charges—above		

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STANDARD COSTS AND FLEXIBLE BUDGETS IN THE BREWING INDUSTRY

By John W. Dixon, C.P.A.,
Scovell, Wellington & Company

THE legislation legalizing the manufacture and sale of beer revived an industry which was dormant during a period of great advances in industrial accounting. When plants were rehabilitated and put into operation, the attention of executives was of necessity concentrated upon getting their product on the market at the earliest possible date and in many cases the accounting practice adopted has been only such as would provide the information required by the various governmental agencies for income and excise taxes. This tendency has been strengthened by the fact that this rehabilitation came at a time when financing was difficult and it was necessary to conserve resources for immediate necessities and defer consideration of accounting problems until other operating problems were settled. Now that the industry has been operating for some months, and since it has been given additional impetus by the repeal of the Eighteenth Amendment, it is a particularly fitting time to review these problems and examine the application of modern accounting principles to the manufacturing and selling methods of the industry.

The immediate problem was to provide, without prohibitive clerical cost, the sales records required by Regulations 9 of the Bureau of Industrial Alcohol and the various state authorities. Any brewery which is operating now must have already found a reasonably satisfactory solution for this. It will be sufficient here to say that the most satisfactory method appears to be through the use of bookkeeping machines, by means of which records are kept showing quantities of cash and charge sales by customers. The same operation handles the accounts receivable and provides a cash control.

The cost accounting problem, while less pressing, is of considerably greater interest. Examining the basic conditions with which we have to contend, we find a continuous process with a uniform product, except for the packaging. The mere determination of costs is very simple. The primary purpose of the account-

ing procedure is to secure control of costs, and incidentally to furnish correct periodic statements. The situation is ideal for the application of standard costs and coordinated budgetary control. Predetermined standards provide the costs for inventory valuation and for the establishment of selling prices and policies. The recorded variances provide the necessary control of costs, indicating immediately where investigation is necessary.

We will consider here the details of an accounting plan embracing these principles for a typical brewery. This brewery has storage capacity of 25,000 barrels. With allowance for expected seasonal variations and the standards of aging decided upon, it is found that the normal annual production is 130,000 barrels. Only one brand of beer is made and it is expected that 50,000 barrels will be sold in kegs and the balance in bottles. The brewery delivers with hired trucks to local and near-by retail dealers and to private individuals. Sales to distributors are made at the shipping platform. All bottled beer is in cases of 24 twelve-ounce bottles and a deposit of $1 is required on each case. Keg beer is sold in half and quarter barrels and deposits on cooperage are required of some customers. The sales are about half cash and half charge. Transfers of beer from the brewery to the bottling house are made by pipe line through government-controlled tanks.

The plan, as outlined here, is designed to reduce the amount of clerical work to a minimum. This is particularly important since the government regulations have forced upon the breweries an excessive clerical expense in connection with sales records. The system is built about a comparatively simple general ledger. Without going further than this general ledger, we get accurate periodic statements and inventory valuations. The cost control element is introduced by a detailed analysis of expense posted to periodic Burden Statements. There is no cost ledger or factory ledger, a bound set of Burden Statements each period taking the place of this record.

Profit and Loss Statement

The budgetary control idea is carried to its logical conclusion in the projected periodic balance sheet and the projected profit and loss statement. (Exhibits A and B). It is expected, in this

EXHIBIT A

BALANCE SHEET AS AT DECEMBER 2, 1933

Assets

		Actual	*Projected*
Cash in Banks	$ 64,650		
Cash on Hand	2,000	$ 66,650	$ 73,733
Accounts Receivable	84,608		
Less Reserve for Bad Debts	2,700	81,908	80,800
Inventories		219,482	212,000
Total Current Assets		$368,040	$366,533
Cases, less Reserve for Depreciation	43,850		
Bottles, less Reserve for Breakage	58,111	101,961	100,500
Plant and Equipment	620,573		
Less Reserves for Depreciation	252,961	367,612	369,400
Deferred Charges			
Unexpired Insurance	1,016		
Water Deposits	300		
Prepaid Taxes	495	1,811	2,000
		$839,424	$838,433

Liabilities and Net Worth

		Actual	*Projected*
Bank Loans		$ 80,000	$ 80,000
Accounts Payable		22,013	30,000
Reserves for Refund			
Cases and Bottles	$ 41,078		
Cooperage	14,848	55,926	54,000
Accrued Expenses			
Local Taxes	2,672		
Federal Income Tax	31,105		
Payroll	8,510		
Interest	860	43,147	42,000
Total Current Liabilities		$201,086	$206,000
Capital Stock	350,000		
Surplus, Balance Beginning of Year	112,079		
Profit to Date	176,259		
Total Net Worth		638,338	632,433
		$839,424	$838,433

EXHIBIT B

PROFIT AND LOSS STATEMENT

For the Four Week Period ended December 2, 1933, and Year to Date

	Four Week Period			Variances		Year to Date			Variances	
	Projected	*Budget*	*Actual*	*Due to Volume*	*Other*	*Projected*	*Budget*	*Actual*	*Due to Volume*	*Other*
Net Sales	$169,934	$173,167	$170,710	$3,233	$2,457*	$720,893	$748,942	$744,143	$28,049	$4,799*
Standard Cost of Sales	96,816	98,320	98,320	1,504*	xxx	410,910	424,048	424,048	13,138*	xxx
Gross Profit based on Standard Cost, Schedule 1..	$ 73,118	$ 74,847	$ 72,390	$1,729	$2,457*	$309,983	$324,894	$320,095	$14,911	$4,799*
Cost Adjustments										
Over–(Under–*) Earned Burden (all centers)...	1,820*	1,423*	1,423*	397	xxx	330*	1,830	1,830	2,160	xxx
Manufacturing Variances										
General Plant Burden, Schedule 2.....	xxx	xxx	180*	xxx	180*	xxx	xxx	316*	xxx	316*
Power Plant, Schedule 3.....	xxx	xxx	220*	xxx	220*	xxx	xxx	208	xxx	208
Brewery, Schedule 4.....	xxx	xxx	117	xxx	117	xxx	xxx	82	xxx	82
Racking Room, Schedule 5.....	xxx	xxx	60	xxx	60	xxx	xxx	130	xxx	130
Bottling House, Schedule 6.....	xxx	xxx	214	xxx	214	xxx	xxx	425	xxx	425
151 Interest Charged to Cost.....	4,316	4,316	4,316	xxx	xxx	17,264	17,264	17,264	xxx	xxx
152 Excess Depreciation Charged to Cost.....	560	560	560	xxx	...	2,240	2,240	2,240	xxx	...
153 Fixed Charge Variances	xxx	xxx	...	xxx	...	xxx	xxx	...	xxx	...
154 Material Price Variances	xxx	xxx	495*	xxx	495*	xxx	xxx	938*	xxx	938*
155 Inventory Adjustments	xxx	xxx	...	xxx	...	xxx	xxx	...	xxx	...
Gross Profit after Cost Adjustments.....	$ 76,174	$ 78,300	$ 75,339	$2,126	$2,961*	$329,157	$346,228	$341,020	$17,071	$5,208*
160 Delivery Cost, Schedule 7.....	$ 10,800	$ 11,180	$ 10,977	380*	203	$ 45,290	$ 48,860	$ 48,100	3,570*	760
163 Selling Expense, Schedule 8.....	12,260	12,395	12,900	135*	505*	48,850	50,119	51,110	1,269*	991*
166 Administrative Expense, Schedule 9.....	8,580	8,625	8,710	45*	85*	33,800	33,952	34,116	152*	164*
Total Non-Manufacturing Expense.....	$ 31,640	$ 32,200	$ 32,587			$127,940	$132,931	$133,326		
Operating Profit	$ 44,534	$ 46,100	$ 42,752	$1,566	$3,348*	$201,217	$213,297	$207,694	$12,080	$5,603*
Other Income										
170-2 Interest, Discounts, etc.	300	300	240	xxx	60*	1,200	1,200	1,090	xxx	110*
	$ 44,834	$ 46,400	$ 42,992			$202,417	$214,497	$208,784		
Other Expense										
180 Interest Paid	600	600	420	xxx	180	2,000	2,000	1,420	xxx	580
Net Income before Federal Tax.....	$ 44,234	$ 45,800	$ 42,572	$1,566	$3,228*	$200,417	$212,497	$207,364	$12,080	$5,133*
190-2 Allowance for Federal Income Taxes.....	6,635	6,870	6,386	235*	484	30,063	31,875	31,105	1,812*	770
Net Income	$ 37,599	$ 38,930	$ 36,186	$1,331	$2,744*	$170,354	$180,622	$176,259	$10,268	$4,363*

* Losses.

case, that the brewery can sell its full annual capacity of 130,000 barrels, but the sales and manufacturing volume are expected to vary between periods and the capacity was set with allowance for this seasonal variation in sales. With the sales in each period estimated in advance, we can work back from this to a complete estimated profit and loss statement for each period, and a balance sheet at the end of each period, based on standard costs.

The "Projected" figures on Exhibits A and B and on Schedule 1 are prepared at the beginning of the year for each period and represent the aims and expectations for the year's operations. These figures should be useful in formulating policies and in obtaining credit, especially when they are followed up with periodic statements of actual performance. They will indicate when borrowing must be done and when funds will be available to liquidate borrowings.

On Exhibit B, the "Budget" column represents the results as they should have been at the actual volume attained if standards of cost, selling price, etc., had been exactly met. The difference for each item between "Projected" and "Budget" indicates the extent to which sales and manufacturing volume differed from that anticipated for the period. The variances, or differences between "Budget" and "Actual," are a measure of the success with which the budget is lived up to, and if losses cannot be readily explained, they should be carefully investigated. Space does not permit a discussion of the possible significance of the particular figures shown on the statement in Exhibit B, but if the statement is studied carefully and the possible meaning of the variances considered, it will be seen that it calls attention to conditions which might otherwise escape notice.

The spaces on this statement which are marked with x's are so filled in because, from the nature of the item, the space will never be used.

The flexible budget for the actual volume attained each period, which serves to segregate losses and gains due to changes in volume, is an important point in budgetary control. Because of the omission of this feature many budget plans lose much of their usefulness as soon as volume varies significantly from the estimates. There are few industries where sales and manufacturing

volume for a particular period of the year can be forecast with sufficient accuracy to give proper control of expense without making use of this device.

General Ledger

The chart of accounts of the general ledger and the expense classification for the burden statements are shown in Exhibits C and D, respectively. The asset and liability accounts of the general ledger are somewhat simplified and some accounts would have to be added to cover any particular case, but all of the accounts which are necessary for the plan are included.

The numbering system is, of course, subject to different treatment but the system shown is very flexible and should be adaptable to almost any situation. The general classifications are as follows:

General Ledger (Exhibit C)
- 1–99 Assets and Liabilities
- 101–199 Profit and Loss Accounts

Expense Classification (Exhibit D)

Prefix (Burden Centers)
- 200 General Plant Burden
- 300 Power Plant
- 400 Brewery
- 500 Racking Room
- 600 Bottling House
- 700 Delivery
- 800 Selling
- 900 Administrative

Suffix (Burden Elements)
- 01–19 Raw Materials
- 20–29 Salaries and Wages
- 30–39 Supplies
- 40–59 Miscellaneous Expense
- 60–69 Fixed Charges

Thus in the Expense Classification, 436 represents Supplies for the Brewery.

The general scheme is that all operating expenses, including raw material, direct labor, manufacturing, delivery, selling and administrative expense are charged in the general ledger to Account 150, Unearned Burden and Manufacturing Variances. The same items are posted in detail in the Distribution Record to be explained later by means of a series of analysis sheets where a complete analysis is made by expense classifications. The totals from this Distribution Record are then carried to Burden State-

EXHIBIT C

CHART OF ACCOUNTS

General Ledger

Assets

1	Cash in Banks
2	Cash on Hand
5	Accounts Receivable
10	Reserve for Bad Debts
20	Inventory, Raw Material
21	Inventory, Bulk Beer in Brewery
22	Inventory, Keg Beer in Racking Room
23	Inventory, Bulk Beer in Bottling House
24	Inventory, Case Beer in Bottling House
25	Inventory, Supplies
26	Revenue Stamp Clearance Account
27	Revenue Stamp Inventory
30	Cases
31	Bottles
32	Reserve for Case Depreciation
33	Reserve for Bottle Breakage
40	Plant and Equipment
41	Reserves for Depreciation
51	Unexpired Insurance
52	Water Deposits
53	Prepaid Taxes

Liabilities

60	Bank Loans
65	Accounts Payable
70	Reserve for Refund, Cases and Bottles
71	Reserve for Refund, Cooperage
81	Accrued Local Taxes
82	Accrued State Excise Tax
83	Accrued Federal Income Taxes
84	Accrued Payroll
85	Accrued Interest

Net Worth

90	Capital Stock
95	Surplus

Profit and Loss Accounts

101	Case Sales, Private
102	Case Sales, Dealers
103	Case Sales, Distributors
111	Keg Sales, Private
112	Keg Sales, Dealers
113	Keg Sales, Distributors
120	Sales Returns and Allowances, Case
121	Sales Returns and Allowances, Keg
130	Cost of Sales, Case
140	Cost of Sales, Keg
150	Unearned Burden and Manufacturing Variances
151	Interest Charged to Cost
152	Excess Depreciation Charged to Cost
153	Fixed Charge Variances
154	Material Price Variances
155	Inventory Adjustments
160	Delivery Cost
163	Selling Expense
166	Administrative Expense
170	Interest Earned
171	Cash Discounts Received
172	Miscellaneous Income
180	Interest Paid
190	Federal Income Tax
191	Federal Capital Stock Tax
192	Federal Excess Profits Tax

EXHIBIT D

EXPENSE CLASSIFICATION

		General Plant 200	Power Plant 300	Brewery 400	Racking Room 500	Bottling House 600	Delivery 700	Selling 800	Administrative 900
01 to 19—Raw Materials									
Variable									
01	Choice Malt			x					
02	Caramel Malt			x					
03	Other Malt			x					
04	Rice			x					
05	Grits			x					
06	Domestic Hops			x					
07	Imported Hops			x					
08	Other Raw Materials			x					
09	Grain Sales (Credit)			x					
10	Crowns and Labels				x				
21 to 29—Salaries and Wages									
Variable									
21	Departmental Labor	x	x	x	x	x	x		
22	Repair Labor, Cases					x			
23	Repair Labor, Cooperage				x				
24	Office Salaries	x					x	x	x
25	Salesmen's Salaries							x	
Fixed									
27	Executive Salaries	x						x	x
28	Superintendence	x	x	x	x	x	x		
29	Repair Labor—Buildings, Machinery and Equipment	x	x	x	x	x			x
31 to 39—Supplies									
Variable									
31	Water		x	x	x	x			
32	Purchased Power	x	x	x	x	x		x	x
33	Fuel		x						
34	Repair Materials, Cases					x			
35	Repair Materials, Cooperage				x				
36	Miscellaneous Supplies	x	x	x	x	x	x	x	x
Fixed									
37	Repair Materials—Buildings, Machinery and Equipment	x	x	x	x	x			x
38	Purchased Repairs	x	x	x	x	x			x
39	Stationery, Office Supplies and Postage	x						x	x

EXHIBIT D—*(Continued)*

EXPENSE CLASSIFICATION—*(Continued)*

		General Plant 200	*Power Plant 300*	*Brewery 400*	*Racking Room 500*	*Bottling House 600*	*Delivery 700*	*Selling 800*	*Administrative 900*
40 to 59—Miscellaneous Expense									
Variable									
40	Compensation Insurance	x	x	x	x	x	x	x	x
41	Beer Lost and Consumed				x	x			
42	Bottle Breakage					x			
43	Cullet Sales (Credit)					x			
44	Case Depreciation					x			
45	Trucks Hired						x		
46	Advertising						x	x	
47	Telephone and Telegraph	x					x	x	x
48	Travel	x						x	x
49	Miscellaneous Freight and Cartage In			x					
50	Miscellaneous Expense	x	x	x	x	x	x	x	x
Fixed									
55	Donations								x
56	Dues and Subscriptions								x
57	Profesional Services								x
60 to 69—Fixed Charges									
Fixed									
60	Real Estate Taxes	x	x	x	x	x		x	x
61	Personal Property Tax	x	x	x	x	x		x	x
62	State Franchise Tax								x
63	Federal Permit Fee	x							
67	Insurance	x	x	x	x	x	x	x	x
68	Interest on Investments	x	x	x	x	x		x	x
69	Depreciation—Buildings, Machinery and Equipment	x	x	x	x	x		x	x

ments for each center and comprise the "Actual" column of the final Burden Statements (see Schedules 3 and 4, pages 617 and 618).

Account 150, Unearned Burden and Manufacturing Variances, receives two classes of credits. The first is the standard cost of production in each manufacturing center with corresponding debits to the proper inventory accounts. The second is the total actual charges to Centers 700, Delivery; 800, Selling; and 900, Administrative, with corresponding debits to General Ledger Accounts 160, 163 and 166, respectively. The balance in this account after these credits, represents unearned or overearned burden and net manufacturing variances for the year to date, and is in agreement with the total of unearned burden and variances shown on the Burden Statements for Centers 200 to 600, inclusive.

The raw material and in-process inventories are valued throughout at standard cost. Raw material invoices are repriced at standard purchase price and the variance carried immediately to the Material Price Variance Account, 151, the standard cost going to Raw Material inventory. The process inventories are charged at standard cost for the work performed in each center as mentioned above and are charged direct with the Federal and state excise taxes. Transfers from one inventory stage to the next are made at standard cost up to that point, as are the transfers from inventory to cost of sales.

The brewing business has one peculiarity which makes it very simple to adapt a standard cost plan. While the manufacturing process extends over a period of sixty days or more, the manufacturing effort is applied almost entirely at three well defined points, the time consumed at each point being comparatively short.

Almost all of the brewing cost is incurred in the first few hours of the process. The standard cost of a period's production or "Earned Burden" in the Brewery is thus taken as the number of barrels brewed or started in the process priced at the full standard brewing cost, and the inventory of Bulk Beer in Brewery includes beer at all stages of aging priced at this same cost. There is a slight overvaluation of inventory introduced in this way, but it is negligible for all practical purposes. All of the racking cost is applied as the beer is racked off into kegs and the earned burden of the Racking Room is thus calculated on

the barrels racked. The bottling process takes a short time and the earned burden of the Bottling House is calculated on the cases produced.

Burden Statements and Budgetary Control

We have covered, in a rough way, the operation of the General Ledger accounts and will now consider the Burden Statements and budgets before returning to a detailed consideration of special General Ledger accounts and sources of information.

The primary purpose of the Burden Statements is to make possible an analysis of the difference between earned burden and actual burden for each manufacturing center. This difference consists of two factors, first, unearned or overearned burden caused by operation at a different volume from normal, and second, manufacturing variances, or variations from what the expense should be at the actual production rate.

In order to get the most accurate possible division between these two factors, the expense classification provides a distinction between variable and fixed elements of expense. The expenses are grouped in this way on the Burden Statements, and the period's budget for variable expenses is determined by increasing or decreasing the normal expense by the percentage above or below the normal rate of production. The percentage of normal is determined for each center each period by dividing the actual production in barrels or cases by the normal. This percentage of the normal variable expense then becomes the period budget. The budget for fixed expense is the same as the normal regardless of the rate of production.

In the case of the service centers, General Plant Burden and Power, there is no factor of unearned burden, the budgeted expense being distributed to other centers on the basis of service rendered, leaving only the variances to be analyzed in these centers. The percentage of normal operation in these centers is determined by a composite of the rates in the centers served as shown on the specimen statement for Power Plant (Schedule 3). Where the redistribution of these centers appears on the Burden Statements of the other centers, the budget is thus the same as the actual.

The first column on each statement shows the estimated expense for one period at normal production rate (in this case one-thirteenth of 130,000 barrels or 10,000 barrels for the Brewery). These comprise the standard costs and are the same on each period's statements until a change in standards is made. This normal expense expressed as dollars per unit of production is applied to the period's actual production to determine earned burden in each manufacturing center.

The difference between total budgeted expense for each center and the earned burden represents unearned or overearned burden, and the item by item differences between the budget and actual give the analysis of manufacturing variances.

In the case of the non-manufacturing centers, Delivery, Selling and Administrative, the expense at the normal rate is estimated and appears in the same way as for manufacturing centers, but the budget is determined somewhat differently for Delivery. In this center four separate standard unit rates are determined for each item of variable expense. The four rates are as follows:

1 Rate per barrel for truck delivery of kegs
2 Rate per barrel for platform delivery of kegs
3 Rate per case for truck delivery of cases
4 Rate per case for platform delivery of cases

This is not as difficult as it might appear because in most cases certain trucks will carry only kegs and others only cases because of the different type of truck body required.

The period's sales in units are extended as follows:

Sales accounts 111 and 112 at Rate 1
Sales account 113 at Rate 2
Sales accounts 101 and 102 at Rate 3
Sales account 103 at Rate 4

This is done for each item of variable delivery expense and the four standards are added together to get the budget for the period for that item of expense.

Budgets for redistributed and fixed delivery expenses are determined in the same way as for manufacturing centers.

Budgets for Selling and Administrative are determined in the same way as for manufacturing centers, the percentage of normal operation being determined by dividing actual dollar volume of sales, priced at standard selling prices, by normal sales.

In the case of non-manufacturing centers the General Ledger accounts 160, 163 and 166 agree with the actual expense on the Burden Statements. In preparing the profit and loss statement, reference to the burden statements will give the division of these figures into budget and variance.

The year to date figures on the Burden Statements are obtained by adding the current period's figures to the Year to Date totals on the previous period's statements. The Year to Date totals are the figures which will be in agreement with the General Ledger in each case.

There is no machinery set up in continuous operation to determine the causes of variances. This would require far too much clerical work. The method employed is to let the variances show themselves and then, if a satisfactory explanation is not obtainable in a given case, a procedure can be started which will allow close scrutiny of this particular variance in the future with possibly weekly or even daily comparisons with the budget. When the trouble has been located and corrected, the procedure can then be discontinued.

Standard Journal Entries and Production Reports

With this rather detailed consideration of the budgetary control features of the Burden Statements, we will return to certain features of the General Ledger accounting.

It will be noted from the chart of accounts that interest on investment has been considered an element of cost. Disregarding the theoretical aspects of this treatment, it was done for the very practical reason of allowing an intelligent comparison of cost and selling price as between case beer and keg beer. Interest is calculated at a conservative investment rate on investment in land, buildings, machinery and equipment, cases and bottles, cooperage and average inventories, and is prorated to centers in proportion to the investment involved in each. This is charged to cost and credited to an income account, Interest Charged to Cost.

Both interest and depreciation are calculated on present day replacement values. In the case of a new brewery original cost values can be used, but most established breweries will be found to have wholly inadequate plant records which do not permit proper division of depreciation and investment between centers. Further-

more, the various items of buildings and equipment will have been purchased at various price levels, giving an inequitable distribution between centers.

Depreciation is charged to cost even though particular items of equipment are fully depreciated on the books. Most breweries which were in operation before prohibition will have very little left in their net plant values except land and current rehabilitation expense. In many cases this has been brought about by large obsolescence claims for 1919 excess profits taxes. The depreciation charged to cost is credited to the account Excess Depreciation Charged to Cost. The depreciation properly deductible for profit and loss and income tax purposes is charged to this account and credited to the proper depreciation reserves.

In the original development of normal burden charges, the fixed items of taxes, insurance, interest on investment and depreciation (Elements 60 to 69) are carefully prorated to the various centers. A standard periodic journal entry is then prepared to be entered in the general books each period, charging the total of all of these elements to Unearned Burden and Manufacturing Variances. The pro forma journal entry is as follows:

Dr. 150 Unearned Burden and Manufacturing Variances
Cr. 152 Interest Charged to Cost
153 Excess Depreciation Charged to Cost
154 Fixed Charge Variances

The last account in this entry is to take care of variances in taxes and insurance. The standard amount charged to cost for these two elements is credited here, and accurate periodic accruals based upon later information are charged to this account.

As mentioned previously, the only operating costs which are not carried through the Burden Statements are Federal and State excise taxes. The laws of most states differ from each other and from the Federal laws as to when the tax accrues. In order to avoid complications, all are considered to accrue in accordance with the Federal regulations and are charged to inventory at this point. Any state taxes which accrue at a later point are simply carried in a liability account until payment is due.

The Federal tax is based on liquor manufactured and Regulations 9 provides that the manufacturing process is completed when the beer leaves the confines of the brewhouse. The racking room

and keg beer storage room are ordinarily in the brewhouse in order to allow racking in advance of immediate requirements without tying up money in tax-paid beer. The bottling house, however, must be a separate building and the tax on bottled beer accrues and must be paid when the beer is transferred to the bottling house. There are usually two sets of government-controlled measuring tanks, either set of which will hold at least one day's requirements of the bottling house. The exact moment of transfer is when the government inspector locks the inlets and unlocks the outlets of the full tanks and does the reverse to the empty tanks. At this time he must be presented with revenue stamps to the value of $5 per barrel of 31 gallons for the beer which he has released at the full tanks.

The tax thus accrues on sales of keg beer and on the transfers of beer to the bottling house. This information is incorporated in a journal entry each period as follows:

Dr. 22 Keg Beer in Racking Room
Dr. 23 Bulk Beer in Bottling House
Cr. 26 Revenue Stamp Clearance Account
Cr. 82 Accrued State Excise Tax
To charge inventories with Federal and State Excise Tax which should have been paid based on production records.

The keg beer tax is put into inventory and is immediately removed in the cost of sales entry. This is done in order that there will be only one entry to Cost of Sales each period.

Another entry is made crediting Revenue Stamp Inventory and charging Revenue Stamp Clearance Account for the amount of stamps actually used. This gives a check on the use of stamps. There should never be a credit balance in the Clearance Account and any debit balance should represent stamps affixed to kegs which have not yet been sold.

The accrual of state excise tax set up in the entry shown above should be carried as a liability until it is payable, at which time this account would be charged. If the state has an additional cap tax on bottled beer, it should be handled in somewhat the same manner but charged to the inventory of case beer in Bottling House with a corresponding credit to a liability account or stamp inventory.

Daily Racking and Bottling Reports

We will consider next the production records which are the source of the information for the entries involving earned burden and inventories.

On or before the fifth of each month the brewery must file with the Commissioner of Industrial Alcohol a return on Treasury Department Form 103. This form includes a daily record of the various raw materials received and used, liquor produced, liquor removed to the bottling-house by pipe-line, liquor removed from the brew-house in barrels and kegs, and a summary of revenue stamps bought and used during the month. This record must be made up daily, so on the morning of the first day after the end of the period, this information can be summarized for use. A copy of Form 103 was reproduced in the Bulletin of August 1, 1933 (Vol. XIV, Section I, pp. 1694-5). This provides the information for the tax entry above and for the following entries:

FIGURE 1

Raw Material Used—Charge Unearned Burden and Mfg. Variances (Raw Materials, Brewery 401-8) and credit Raw Materials Inventory at standard prices.

Earned Burden, Brewery—Charge Bulk Beer in Brewery and credit Unearned Burden and Variance for beer produced at standard brewing cost.

Transfer to Bottling House—Charge Bulk Beer in Bottling House and credit Bulk Beer in Brewery for beer transferred at standard brewing cost.

The Daily Racking Report (Figure 1) when summarized for the period provides the information for three more entries. This report is submitted by the Racking Room foreman daily showing the barrels racked and a physical inventory at the beginning and end of the day. The form is then given to the shipping clerk who records the barrels of keg beer sold. The summary of these reports for the period must agree with the sales summary as to the barrels sold.

The entries made up from this report are as follows:

Earned Burden, Racking Room—Charge Keg Beer in Racking Room and credit Unearned Burden and Mfg. Variances with total barrels racked at standard racking cost.

Beer Transfer to Racking Room—Charge Keg Beer in Racking Room and credit Bulk Beer in Brewery with total barrels racked at standard brewing cost.

Beer Lost or Consumed, Racking Room—Charge Unearned Burden and Mfg. Variances (Beer Lost or Consumed, Racking Room 541) and credit Keg Beer in Racking Room with barrels lost or consumed at standard brewing cost plus standard racking cost.

FORM NO. 108

DAILY RACKING REPORT Day_____ Date_____ No. 00101

For_____ Brewery.

BRAND												
ON HAND A. M.		RACKED		SOLD		USED		ON HAND P. M.	
½	¼	½	¼	½	¼	½	¼	½	¼

BRAND												
ON HAND A. M.		RACKED		SOLD		USED		ON HAND P. M.	
½	¼	½	¼	½	¼	½	¼	½	¼

BRAND												
ON HAND A. M.		RACKED		SOLD		USED		ON HAND P. M.	
½	¼	½	¼	½	¼	½	¼	½	¼

REMARKS

Inventory By_____

Prepared By_____

FIGURE 1

FORM NO. 594 No. 00151

DAILY BOTTLING REPORT

Day _____ Brewery _____ Date _____

BEER IN BULK

Barrels on Hand A. M.	
Released at Government Tanks	
Total to be accounted for	
Less: Barrels on Hand P. M.	
Bottled (A)	

Prepared By _____
BOTTLING HOUSE SUP'T

BEER IN BOTTLES

Cases on Hand P. M.	
Cases Sold	
Total	
Less: Cases on Hand A. M.	
Cases Realized (B)	

Prepared By _____
SHIPPING CLERK

AVERAGE YIELD PER DAY

Cases Realized Per Barrel (B÷A)	
Beer Used From Bulk (A)	
Barrels Realized (.07258 x B)	
Barrels Lost Including Consumption in Bottling House	

Prepared By _____
WORKS ACCOUNTANT

FIGURE 2

The Daily Bottling Report (Figure 2) when summarized, provides the necessary information for the entries for bottling house earned burden and loss of beer. The first section of the report is made out by the bottling house superintendent. The shipping clerk makes out the second section of another copy and both are submitted to the accounting department. Here both copies are completed, including the calculations in the third section and one copy goes back to the bottling house superintendent for his information. The form shown provides for determining the cases produced by physical inventory each day of the cases on hand. This is a small job but more dependable figures would be obtained by installing automatic counters on the labeling machines or case conveyors, in which case the bottling house superintendent would make out the second section of the report also, reporting directly the cases bottled and omitting the inventory and sales figures.

The average yield and loss of beer are important items to control and this report should be submitted to the General Manager immediately if the figures for any day are outside of predetermined limits. The average expected yield would be from 12½ to 13 cases per barrel, the theoretical equivalent being 13.778 cases of 24 twelve-ounce bottles per barrel of 31 gallons. One case is .07258 of a barrel so this factor is applied to the cases produced to determine the actual amount of beer in the bottles for comparison with the beer used.

When these reports are summarized for the period the following entries are made:

Earned Burden, Bottling House—Charge Case Beer in Bottling House and credit Unearned Burden and Mfg. Variances with cases produced at standard bottling cost per case.

Beer Used in Bottling—Charge Case Beer in Bottling House with barrels in cases produced at standard brewing cost plus excise taxes,
Charge Unearned Burden and Mfg. Variances (Beer Lost or Consumed, Bottling House 641) with barrels lost or consumed at standard brewing cost plus excise taxes and
Credit total to Bulk Beer in Bottling House.

The entries for cost of sales complete the list of entries needed to operate the inventories of raw material and beer in process. The unit figures for these entries come from the sales summaries. The keg beer sales in barrels are priced at the complete standard cost of keg beer including brewing cost, racking cost and excise tax. The case beer sales expressed in cases are priced at the

standard cost per case which consists of .07258 of the per barrel brewing cost and per barrel excise tax plus the bottling cost per case. These entries are charges to the respective cost of sales accounts and credits to Keg Beer in Racking Room and Case Beer in Bottling House.

The usage of crowns, labels and supplies from inventory is reported through a system of supply requisitions. All large items of supplies can be handled at standard prices if desired, taking the price variance at the time of purchase, or they may be carried through at actual cost.

The journal entries which have been described do not comprise all of the necessary periodic entries by any means, but those not mentioned are the ordinary entries common to all methods of factory accounting.

Distribution Record

The Distribution Record previously referred to is used to accumulate postings for various items of expense without having a ledger account for each expense in each center. It consists of a series of analysis sheets of approximately 14 columns, in a binder, there being one sheet for each burden element. On each sheet a column is headed for each center which uses this element classification. After all postings are made for one period, the various groups of postings are totaled and the totals carried to the Burden Statements. A new date is stamped under the totals and the sheets are ready for the next month's postings. Postings can be made from day to day and balanced in blocks, in order that totals will be available soon after the close of the period.

Container Accounting

The system of container accounting outlined here is somewhat simpler than the usual method. The cooperage is carried as part of the Plant and Equipment accounts and depreciation thereon is charged to the Racking Room in the fixed charges. The depreciation rate depends on the type of business handled. In the case of the typical brewery under consideration 20% per year is considered a fair rate. If the beer is shipped long distances, the rate should be higher. Deposits on cooperage whether paid in cash or carried on account are credited to Account 71, Reserve for Re-

fund, Cooperage. When deposits are refunded or credit given for kegs returned, this account is charged. The balance in the account is considered a current liability.

The deposits on cases and bottles are handled in the same way as deposits on cooperage. The deposit of $1 being required on all cases, the balance of the Reserve for Refunds is taken to represent the number of cases outstanding. At the end of the year, in connection with the container inventory, this liability account is reduced by the number of cases estimated to have been lost or destroyed in the hands of customers, the credit side of the entry being to the Reserve for Case Depreciation and Reserve for Bottle Breakage.

A physical inventory is taken annually of cases and bottles, including the cases outstanding as shown by the adjusted Reserve for Refund. The inventory of cases is priced at the cost of the most recently purchased cases. Assume that the purchases for the past three years were as follows:

1933 60,000 cases @ 40¢
1932 30,000 cases @ 48¢
1931 30,000 cases @ 55¢

If there are 100,000 cases in the inventory, they would be priced 60,000 cases @ 40¢ 30,000 @ 48¢ and 10,000 cases @ 55¢. The reduction in the asset account necessary to adjust to this inventory would be carried to the Reserve for Case Depreciation.

The reserve for depreciation receives during the year a credit at a flat rate per case bottled of about one cent. After the above adjustments have been carried to the depreciation reserve, the reserve is adjusted to the correct amount on the basis of a rate of about 15% per year, the adjustment being made to Case Depreciation Expense, 644. In the case above, the correct reserve would be calculated as shown below:

Reserve for Case Depreciation, December 31, 1933

Year Purchased	*Quantity*	*Price*	*Asset Value*	*Accrued Depreciation at 15%*	
				Per Cent	*Amount*
1931.....	10,000	.55	$ 5,500	37½%	$2,062.50
1932.....	30,000	.48	14,400	22½	3,240.00
1933.....	60,000	.40	24,000	7½	1,800.00
	100,000		$43,900		$7,102.50

The relative size of the final adjustment to the reserve at the end of each year serves as a check on the accuracy of the rate per case which is charged to cost each period.

After several years' operation, the above schedule serves as a check upon the yearly depreciation rate, as the oldest cases should be approximately fully depreciated when the annual purchases have leveled off to a uniform amount.

There is no accrued depreciation on bottles. A bottle is a bottle as long as it is not broken. In fact old bottles are worth more than new ones because they have been through the process and those which will not stand the pressure have been eliminated. Therefore there is no depreciation reserve required. The inventory including bottles on hand and outstanding, is priced in the same way as the asset value of cases. During the year an allowance equal to the cost of about one bottle per case bottled has been charged to cost and accumulated in the Reserve for Bottle Breakage. The Reserve for Bottle Breakage has also received a portion of the credit for reduction of the deposit liability. At the end of the year the Reserve for Bottle Breakage is closed to the Bottle asset account where the year's purchases have accumulated and this account is then adjusted to the inventory value, the opposite side of the adjusting entry being to Bottle Breakage expense, 642.

This gives a complete description of the handling of containers on the books. The method gives accurate asset values and costs and involves a negligible amount of bookkeeping during the year.

A record of the location of outstanding containers sold on charge sales is kept in connection with accounts receivable. No record is kept of the location of containers which went out on cash sales as this is, in most cases, more trouble than it is worth. The excess of cost over the cash deposit received is not enough to justify any clerical work in keeping track of these containers.

General

A certain amount of education is necessary in order to demonstrate to the executives the usefulness of a cost plan such as has been described. Most brewing executives in the past have been accustomed to working only from a statement of brewing and bottling costs per unit. Such figures can, of course, be easily obtained under this plan, but the analysis of variances gives a clear

and concise picture of what the executive formerly hoped to find by comparing unit costs with those of a previous period.

One of the most valuable features of the plan is that each department head or foreman receives a periodic statement of the operation of his department, measured against a reasonable standard. The response to such a state will be surprising in a plant where reliable information of this sort has not been available to the foremen, and very often savings will be effected which would otherwise be overlooked by the management.

SCHEDULE 1

STATEMENT OF SALES AND GROSS PROFIT

For the Four Week Period Ended December 2, 1933, and Year to Date

		Four Week Period			Variances		Year to Date			Variances	
		Projected	*Budget*	*Actual*	*Due to Volume*	*Other*	*Projected*	*Budget*	*Actual*	*Due to Volume*	*Other*
Case Beer Sales											
101 Private	9,410 cases	$ 20,400	$ 21,172	$ 21,172	$ 772	....	$ 82,100	$ 89,463	$ 89,463	$ 7,363	....
102 Dealers	26,470 cases	45,200	47,646	46,322	2,446	$1,324*	198,900	203,460	200,696	4,560	$2,764*
103 Distributors	30,220 cases	50,100	49,863	49,863	237*	....	203,600	210,932	210,932	7,332	....
Total Case Sales		$115,700	$118,681	$117,357			$484,600	$503,855	$501,091		
120 Less Returns and Allowances		289	297	182	8*	115	1,212	1,260	916	48*	344
Net Case Sales		$115,411	$118,384	$117,175	$2,973	$1,209*	$483,388	$502,595	$500,175	$19,207	$2,420*
130 Standard Cost of Case Sales		64,710	66,100	66,100	1,390*	xxx	272,510	281,416	281,416	8,906*	xxx
Gross Profit Based on Standard Cost		$ 50,701	$ 52,284	$ 51,075	$1,583	$1,209*	$210,878	$221,179	$218,759	$10,301	$2,420*
Keg Beer Sales											
111 Private	70 barrels	$ 1,260	$ 1,400	$ 1,400	$ 140	....	$ 5,800	$ 6,020	$ 6,020	$ 220	....
112 Dealers	2,190 barrels	33,900	35,040	33,945	1,140	$1,095*	151,800	157,416	155,100	5,616	$2,316*
113 Distributors	1,320 barrels	19,500	18,480	18,480	1,020*	....	80,500	83,528	83,528	3,028	....
Total Keg Sales		$ 54,660	$ 54,920	$ 53,825			$238,100	$246,964	$244,648		
121 Less Returns and Allowances		137	137	290	....	153*	595	617	680	22*	63*
Net Keg Sales		$ 54,523	$ 54,783	$ 53,535	$ 260	$1,248*	$237,505	$246,347	$243,968	$ 8,842	$2,379*
140 Standard Cost of Keg Sales		32,106	32,220	32,220	114*	xxx	138,400	142,632	142,632	4,232*	xxx
Gross Profit Based on Standard Cost		$ 22,417	$ 22,563	$ 21,315	$ 146	$1,248*	$ 99,105	$103,715	$101,336	$ 4,610	$2,379*
Total											
Net Sales		$169,934	$173,167	$170,710	$3,233	$2,457*	$720,893	$748,942	$744,143	$28,049	$4,799*
Standard Cost of Sales		96,816	98,320	98,320	1,504*	xxx	410,910	424,048	424,048	13,138*	xxx
Gross Profit Based on Standard Cost		$ 73,118	$ 74,847	$ 72,390	$1,729	$2,457*	$309,983	$324,894	$320,095	$14,911	$4,799*

* Losses.

SCHEDULE 3

POWER PLANT
BURDEN STATEMENT

For the Four Week Period Ended December 2, 1933, and Year to Date

		Four Week Period				Year to Date		
		Normal	*Budget*	*Actual*	*Variance*	*Budget*	*Actual*	*Variance*
Variable Expense								
321	Departmental Labor	$ 400	$ 334	$ 370	$ 36*	$ 1,616	$ 1,745	$129*
331	Water	170	142	150	8	687	620	67
332	Purchased Power	50	42	48	6*	202	181	21
333	Fuel	1,470	1,227	1,390	163*	5,939	5,850	89
336	Miscellaneous Supplies	67	56	40	16	271	220	51
340	Compensation Insurance	1	1	1	..	4	4	..
350	Miscellaneous Expense	15	13	8	5	61	50	11
	Total Variable	$2,173	$1,815	$2,007	$192*	$ 8,780	$ 8,670	$110
Redistributed Expense								
200	General Plant Burden	$ 186	$ 175	$ 175	xxx	$ 756	$ 756	xxx
Fixed Expense								
328	Superintendence	$ 160	$ 160	$ 160	...	$ 640	$ 640	..
329	Repair Labor, Buildings and Equipment	67	67	85	18*	268	200	68
337	Repair Materials, Buildings and Equipment	25	25	50	25*	100	80	20
338	Purchased Repairs	15	15	...	15	60	50	10
360–9	Fixed Charges	473	473	473	....	1,892	1,892	..
	Total Fixed	$ 740	$ 740	$ 768	$ 28*	$ 2,960	$ 2,862	$ 98
	Grand Total	$3,099	$2,730	$2,950	$220*	$12,496	$12,288	$208

Distribution to Center	*Ditribution Percentage*	*Percentage of Normal*	*Product*	*Distribution for Period*	
400 Brewery	70%	87.1%	61.1%	70%	$1,911
600 Bottling House	30	74.6	22.4	30	819
Percentage of Normal			83.5%	100%	$2,730

* Losses.

SCHEDULE 4

BREWERY
BURDEN STATEMENT

For the Four Week Period Ended December 2, 1933, and Year to Date

		Four Week Period				Year to Date		
		Normal	*Budget*	*Actual*	*Variance*	*Budget*	*Actual*	*Variance*
Variable Expense								
401–9	Raw Materials	$20,000	$17,420	$17,463	$ 43*	$ 81,600	$ 81,816	$216*
421	Departmental Labor	1,500	1,307	1,367	60*	6,120	5,974	146
431	Water	110	96	90	6	449	410	39
432	Purchased Power	182	159	169	10*	743	683	60
436	Miscellaneous Supplies	400	348	323	25	1,632	1,532	100
440	Compensation Insurance	16	14	16	2*	65	65	...
449	Miscellaneous Freight and Cartage	20	17	7	10	82	50	32
450	Miscellaneous Expense	236	206	159	47	963	857	106
	Total Variable	$22,464	$19,567	$19,594	$ 27*	$ 91,654	$ 91,387	$267
Redistributed Expense								
200	General Plant Burden	$ 2,784	$ 2,662	$ 2,662	xxx	$ 11,286	$ 11,286	xxx
300	Power Plant	2,169	1,911	1,911	xxx	8,747	8,747	xxx
	Total Redistributed	$ 4,953	$ 4,573	$ 4,573		$ 20,033	$ 20,033	
Fixed Expense								
428	Superintendence	$ 480	$ 480	$ 480	...	$ 1,920	$ 1,920	...
429	Repair Labor, Buildings and Equipment	300	300	206	94	1,200	1,395	195*
437	Repair Materials, Buildings and Equipment	130	130	65	65	520	600	80*
438	Purchased Repairs	60	60	75	15*	240	150	90
460–9	Fixed Charges	1,354	1,354	1,354	...	5,416	5,416	...
	Total Fixed	$ 2,324	$ 2,324	$ 2,180	$144	$ 9,296	$ 9,481	$185*
	Grand Total	$29,741	$26,464	$26,347	$117	$120,983	$120,901	$ 82
Production, Barrels		$10,000		$ 8,710			$ 40,800	
Standard Cost per Barrel		$ 2.9741						
Per Cent of Normal Operation				87.1%			102.0%	
Earned Burden—8,710 Barrels @ $2.9741			25,904			121,343		
Over-earned (Unearned*) Burden			$ 560*			$ 360		

* Losses.

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